WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding the active portion of human agrin, wherein the nucleotide sequence is selected from the group consisting of:
   (a) the nucleotide sequence comprising the coding region of the active portion of human agrin contained in the vector designated as pBL-hAgrin 1 (ATCC Accession No. 97378);
   (b) a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence of (a) and which encodes the active portion of human agrin; and
   (c) a nucleotide sequence that, as a result of the degeneracy of the genetic code, differs from the nucleotide sequence of (a) or (b) and which encodes the active portion of human agrin.

2. An isolated nucleic acid molecule comprising a nucleotide sequence encoding the active portion of human agrin, wherein the nucleotide sequence is selected from the group consisting of:
   (a) the nucleotide sequence as set forth in Figure 15;
   (b) the nucleotide sequence encoding amino acids 24 to 492 as set forth in Figure 15;
   (c) the nucleotide sequence encoding amino acids 60 to 492 as set forth in Figure 15;
   (d) the nucleotide sequence encoding amino acids 76 to 492 as set forth in Figure 15;
   (e) the nucleotide sequence encoding amino acids 126 to 492 as set forth in Figure 15;
   (f) the nucleotide sequence encoding amino acids 178 to 492 as set forth in Figure 15;
   (g) the nucleotide sequence encoding amino acids 222 to 492 as set forth in Figure 15;

(h) the nucleotide sequence encoding amino acids 260 to 492 as set forth in Figure 15;

(i) the nucleotide sequence encoding amino acids 300 to 492 as set forth in Figure 15;

(j) a nucleotide sequence that hybridizes under stringent conditions to any of the nucleotide sequences of (a) through (i) and which encodes the active portion of human agrin; and

(k) a nucleotide sequence that, as a result of the degeneracy of the genetic code, differs from any of the nucleotide sequences of (a) through (j) and which encodes the active portion of human agrin.

3. An isolated nucleic acid molecule of claim 1 or 2, which is lacking an insert at position Y.

4. An isolated nucleic acid molecule of claim 1 or 2, which is lacking an insert at position Z.

5. An isolated polypeptide encoded by the nucleic acid molecule of claim 1, 2, 3 or 4.

6. A polypeptide of claim 5, modified by covalent attachment of a polyethylene glycol molecule.

7. A vector which comprises the isolated nucleic acid molecule of claim 1, 2, 3 or 4.

8. An expression vector comprising a nucleic acid molecule of claim 1, 2, 3 or 4 wherein the nucleic acid molecule is operatively linked to an expression control sequence.

9. A host-vector system for the production of a polypeptide having the biological activity of human agrin which comprises the vector of claim 8, in a suitable host cell.

10. The host-vector system of claim 9, wherein the suitable host cell is a bacterial cell, yeast cell, insect cell, or mammalian cell.

11. A method of producing a polypeptide having the biological activity of human agrin which comprises growing cells of the host-vector system of claim 9 or 10, under conditions permitting production of the polypeptide and recovering the polypeptide so produced.

12. A method of promoting the growth, differentiation or survival of a MuSK receptor expressing cell comprising administering to the cell an effective amount of agrin.

13. The method of claim 12, wherein the MuSK receptor expressing cell is a cell which is normally found in muscle, heart, spleen, ovary or retina.

14. The method of claim 12 or 13, wherein the MuSK receptor expressing cell is a cell which has been genetically engineered to express the MuSK receptor.

15. An antibody capable of specifically binding the polypeptide of claim 5 or 6.

16. A monoclonal antibody of claim 15.

17. A polyclonal antibody of claim 15.

18. A method of detecting the presence of human agrin in a sample comprising:
    a) reacting the sample with an antibody of claim 15, under conditions whereby the antibody binds to human agrin present in the sample; and
    b) detecting the bound antibody, thereby detecting the presence of human agrin in the sample.

19. The method of claim 18, wherein the antibody is a polyclonal antibody.

20. The method of claim 18, wherein the antibody is a monoclonal antibody.

21. The method of claim 18, wherein the sample is a biological tissue.

22. The method of claim 18, wherein the sample is a body fluid.

23. The method of claim 22, wherein the body fluid is selected from the group consisting of cerebrospinal fluid, blood, serum, plasma, urine and saliva.

24. The method of claim 18, wherein the sample is a cell extract.

25. The host-vector system of claim 10, wherein the bacterial cell is E. coli.

26. The host-vector system of claim 10, wherein the yeast cell is Pichia pastoris.

27. The host-vector system of claim 10, wherein the insect cell is Spodoptera frugiperda.

28. The host-vector system of claim 10, wherein the mammalian cell is a COS cell.

29. The host-vector system of claim 10, wherein the mammalian cell is a CHO cell.

30. A method of treating a patient suffering from a disease or disorder affecting muscle comprising administering to the patient an effective amount of the polypeptide of claim 5 or 6, or a derivative thereof.

31. The method of claim 30, wherein the disease or disorder is muscle atrophy resulting from denervation due to nerve trauma, degenerative, metabolic or inflammatory neuropathy, peripheral neuropathy, or damage to nerves caused by environmental toxins or drugs.

32. The method of claim 30, wherein the disease or disorder is muscle atrophy due to a motor neuronopathy.

33. The method of claim 30, wherein the disease or disorder is muscle atrophy due to chronic disuse.

34. The method of claim 30, wherein the disease or disorder is muscle atrophy due to metabolic stress or nutritional insufficiency.

35. The method of claim 30, wherein the disease or disorder is muscle atrophy due to a muscular dystrophy syndrome.

36. The method of claim 30, wherein the disease or disorder is muscle atrophy due to a congenital myopathy

37. The method of claim 30, wherein the disease or disorder is an acquired (toxic or inflammatory) myopathy.

38. A polypeptide as defined in claim 5 or 6, for use in a method of treatment of the human or animal body by therapy or in a method of diagnosis.

39. A polypeptide according to claim 38, for use in a method of treatment of the human or animal body of a disease or disorder that affects muscle.

40. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy resulting from denervation due to nerve trauma, degenerative, metabolic or inflammatory neuropathy, peripheral neuropathy, or damage to nerves caused by environmental toxins or drugs.

41. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy due to a motor neuronopathy.

42. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy due to chronic disuse.

43. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy due to metabolic stress or nutritional insufficiency.

44. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy due to a muscular dystrophy syndrome.

45. A polypeptide according to claim 39, wherein the disease or disorder is muscle atrophy due to a congenital myopathy.

46. A polypeptide according to claim 39, wherein the disease or disorder is an acquired (toxic or inflammatory) myopathy.

47. Use of a polypeptide as defined in claim 5 or 6 in the manufacture of a medicament for the treatment of a disease or disorder affecting muscle.

48. A pharmaceutical composition comprising a polypeptide as defined in claim 5 or 6 and a pharmaceutically acceptable carrier.

49. A diagnostic test kit for detecting the presence of human agrin in a sample, said kit comprising an antibody as defined in any of claims 15 to 17, and means for determining whether or not the antibody binds to human agrin, thereby allowing detection of the presence of human agrin in the sample.

50. A method of treating a patient suffering from a disease or disorder affecting muscle comprising administering to the patient an effective amount of the nucleic acid molecule of claim 1, 2, 3 or 4, or a derivative thereof.

51. A nucleic acid molecule as defined in claim 1, 2, 3 or 4, or a derivative thereof, for use in a method of treatment of the human or animal body by therapy or in a method of diagnosis.

52. A nucleic acid molecule according to claim 51, for use in a method of treatment of the human or animal body of a disease or disorder that affects muscle.

53. Use of a nucleic acid molecule as defined in claim 1, 2, 3 or 4, or a derivative thereof, in the manufacture of a medicament for the treatment of a disease or disorder affecting muscle.

54. A pharmaceutical composition comprising a nucleic acid molecule as defined in claim 1, 2, 3 or 4, or a derivative thereof, and a pharmaceutically acceptable carrier.

55. A nucleic acid molecule according to claim 1, 2, 3 or 4, or a derivative thereof, substantially as hereinbefore described.

56. A vector according to claim 7 or an expression vector according to claim 8, substantially as hereinbefore described.

57. A host vector system according to claim 9, substantially as hereinbefore described.

58. A method according to claim 11, 12, 18, 30 or 50 substantially as hereinbefore described.

59. An antibody according to claim 15 substantially as hereinbefore described.

60. A polypeptide according to claim 39 substantially as hereinbefore described.

61. Use according to claim 47 or 53 substantially as hereinbefore described.

62. A pharmaceutical composition according to claim 48 or 54 substantially as hereinbefore described.

63. A kit according to claim 49 substantially as hereinbefore described.

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